

## Science Teachers and Teaching of Special Education Needs Students

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### KEY IMPLICATIONS

- A validated science teacher survey measuring views about students with special education needs (SEN), self-efficacy views in teaching students with SEN and science teaching practices adopted in inclusive classrooms was constructed.
- The findings were used to design an inservice course to promote better understandings and introduce some strategies for inclusive science teaching.

### BACKGROUND

While students with SEN are expected to demonstrate academic proficiency on standardised assessments in regular classrooms, it also presents challenges to teachers who may not be prepared to teach students with learning needs. There is only a scarce number of studies that discusses science education in the SEN. This study aims to address this gap in the science education literature.

### FOCUS OF STUDY

The research questions addressed in this study were:

1. How did teachers' view SEN students' learning abilities and needs, their self-efficacy views about teaching science to SEN students, and pedagogies adopted in classrooms with SEN students?
2. How did science teachers address the needs of students with dyslexia in their teaching?
3. How effective was the pedagogical practice introduced to support the teaching of students with dyslexia?

### KEY FINDINGS

The teacher survey showed that the science teachers: (a) generally had positive views about students with SEN; (b) felt stress and inadequate teaching alone in inclusive classrooms, and preferred more school support in teaching students with SEN; and (c) had made accommodations and modifications to their science teaching (see Teo, 2021).

Inclusive teaching strategies adopted by science teachers included: (a) modification of class task with same lesson objectives; (b) role assignment in group task which encourages students with SEN to benefit from learning environment; and (c) the use of different modalities during science teaching to promote equal learning opportunities.

Evidence of pedagogical practices adopted by a case study science teacher to support her students with dyslexia transit from being present, to having a sense of belonging, to active participation was found.

## SIGNIFICANCE OF FINDINGS

### Implications for practice

Inclusive pedagogical practices that supported smooth transitional experiences from presence, belonging to participation were effective.

### Implications for research

Proximal data collected using eye tracking data and juxtaposed with lessons videos offered nuanced insights into inclusive practices in science classrooms. More of such data in SEN studies should be conducted to yield nuanced and in-depth insights.

## PARTICIPANTS

A total of 108 teachers took part in the teacher survey. Three teachers from two Singapore primary schools participated in the case studies.

## RESEARCH DESIGN

Phase 1: The teacher survey was designed by conducting a comprehensive literature scan of teacher surveys in SEN studies. The survey was qualitatively validated by experts and quantitatively validated using Rasch analysis. A total of 108 Singapore primary science teachers, recruited from all local schools, completed the survey.

Phase 2: Case studies were conducted in three classrooms located within two Singapore mainstream, co-ed and government schools. Lesson videos, eye-tracking data, and teacher and student interviews were collected and analysed. Emergent and prescriptive coding methods were adopted in qualitative analyses. Eye tracking data were analysed using the DLab propriety software.

## REFERENCES

Teo, T. W. (2021). A Survey of Science Teachers' Perception and Practices in Inclusive Science Classrooms. *Asia-Pacific Journal of Science Education*, 6(2), 388–426.

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